PATENT COOPERATION TREATY

PCT

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITYPCT

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2003P11502WO	**FOR FURTHER ACTION**	See Form PCT/PEA/416

International application No. PCT/EP2004/051687	International filing date *(day/month/year)* 02.08.2004	Priority date *(day/month/year)* 31.07.2003

International Patent Classification (IPC) or national classification and IPC
H04L12/64, H04L12/28, H04M7/00

Applicant
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1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *sent to the applicant and to the International Bureau)* a total of 6 sheets, as follows:

   ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

   ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I   Basis of the opinion

   ☐ Box No. II   Priority

   ☐ Box No. III   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☒ Box No. IV   Lack of unity of invention

   ☒ Box No. V   Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI   Certain documents cited

   ☒ Box No. VII   Certain defects in the international application

   ☒ Box No. VIII   Certain observations on the international application

Date of submission of the demand 30.05.2005	Date of completion of this report 18.10.2005

Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Koch, G Telephone No. +49 89 2399-7679

Box·No. I   Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

   Description, Pages

   1-30   as originally filed

   Claims, Numbers

   1-33   received on 30.05.2005 with letter of 25.05.2005

   Drawings, Sheets

   1/11-11/11   as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☒ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☒ the claims, Nos. 34-43
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

   * *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. IV   Lack of unity of invention

1. ☒   In response to the invitation to restrict or pay additional fees, the applicant has:
   - ☐ restricted the claims.
   - ☒ paid additional fees.
   - ☐ paid additional fees under protest.
   - ☐ neither restricted nor paid additional fees.

2. ☐   This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   - ☐   complied with.

   - ☐   not complied with for the following reasons:

4. Consequently, this report has been established in respect of the following parts of the international application:

   - ☒   all parts.

   - ☐   the parts relating to claims Nos. .

Box No. V   Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-33
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-33
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-33
	No:	Claims	

2. Citations and explanations (Rule 70.7):

   see separate sheet

Box No. VII   Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII   Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1.   Reference is made to the following documents:

    D1: WO 03/010980 A (ERICSSON TELEFON AB L M) 6 February 2003 (2003-02-06)

    D2: WO 02/41574 A (NORTEL NETWORKS LTD ; DORE TAMMY S (US); SHARMA PRATIMA (US); CRAYCRAF) 23 May 2002 (2002-05-23)

2.   Document **D1** is regarded as being the closest prior art to the subject-matter of **claim 1**, and discloses (the references in parentheses applying to this document) a system for converging networks comprising an SS7 network node and a signalling transfer point (page 5, lines 11-23; figure 3) which receives a signalling message (page 5, lines 23-24), determines whether said signalling message can be routed over a packet network based on routing information extracted from the bearer related signalling message (page 5, lines 24-26), encapsulates the received signalling message within a packet (page 5, lines 27-28), and transmits the packet over the packet network (page 5, lines 28-29).

The subject-matter of claim 1 differs from the disclosure of D1 in that the system for converging networks additionally comprises a resource manager operating transparently between the SS7 network node and the signalling transfer point which establishes the bearer for connections over the packet switched network based on the routing information extracted from the signalling messages, but it transmits all signalling messages on the conventional way in the SS7 network.

These features result in the provision of bearer establishment over a packet network for calls originated and terminated in SS7 network. Hence, the technical problem solved is providing bearer establishment over the packet switched network for SS7 network calls without making any modifications on the elements of the SS7 network.

Document **D2** discloses a method for establishing bearer over packet network for

calls originating and terminating in circuit switched networks, however, it fails to disclose any apparatus similar to the resource manager of claim 1, therefore its signalling transfer point needs to be adapted to communicate with the media gateway controller.

Since none of the cited documents, neither taken alone nor taken in combination with each other, provides a hint to use such a resource manager for avoiding any necessary modification on the elements of the SS7 network, **claim 1** meets the requirements of novelty and inventive step and thus satisfies the criterion set forth in Article 33(1)-(4) PCT.

3.   The same considerations are applicable for the method **claim 23** and the product **claim 33** representing the same combination of features as apparatus claim 1, but formulated as a method and a product.

Therefore, **claims 23 and 33** also meet the requirements of novelty and inventive step and thus satisfy the criterion set forth in Article 33(1)-(4) PCT.

4.   **Claims 2-22 and 24-32** are dependent on claim 1 and claim 23, respectively, and, as such, also meet the requirements of the PCT with respect to novelty and inventive step (Article 33(1)-(4) PCT).

Re Item VII
Certain defects in the international application

1.   The independent claims are not correctly cast in the two-part form (Rule 6.3(b) PCT).

2.   The claims do not contain reference signs placed in parentheses (Rule 6.2(b) PCT).

3.   Contrary to the requirements of Rule 5.1(a)(ii) PCT, the most relevant prior art, i.e. documents D1 and D2, is neither acknowledged by reference, nor briefly discussed in the introductory part of the description.

Re Item VIII

Certain observations on the international application

1.   The expressions "transparently introduced" used in **claim 1** (page 31, line 4) and
     "transparently introducing" used in **claim 23** (page 34, line 8) convey the impression
     that the installation of the resource manager is performed on a smooth way, which
     means that its introduction in the network does not cause any interruption or
     disturbance in the operation of the SS7 network node and the signaling transfer point.
     These features, however, are not disclosed in the description, therefore they are not
     supported by the description (Article 6 PCT).

2.   The current formulation of the feature "...and passes on the signallling messages." in
     claim 1 (page 31, lines 10-11) does not clearly state that the signalling messages are
     passed to the signaling transfer point, thereby rendering the definition of the subject-
     matter of said claim unclear (Article 6 PCT).

3.   Furthermore, it should also be pointed out that the subject-matter of **claim 1** is
     directed to a system, however, it comprises features rather related to a process,
     namely "...receives signalling messages...", "...determines whether a bearer
     connection can be established.." and "...coordinates the bearer establishment...",
     therefore the category of these claims are unclear (Article 6 PCT).

4.   Moreover, the vague and imprecise term "network node" used in **claims 3, 5, 6, 10
     and 24-26** does not unambiguously define which element is meant of the converging
     networks and renders the scope of these claims unclear (Article 6 PCT and
     PCT/GL/ISPE/1 5.34 and 5.40). According to figure 1 and the corresponding part of
     the description (see page 5, line 6 - page 6, line 15) the converging network consist
     of a plurality of network nodes (i.e. EO, CRM STP and MG), thus, it should be clearly
     defined which element of the network is actually meant.

5.   Likewise, the same consideration is applicable to the vague and imprecise term
     "network" used in **claims 17, 20 and 30** (Article 6 PCT and PCT/GL/ISPE/1 5.34 and
     5.40) as the application as a whole is directed to converging networks comprising
     both a packet and a circuit switched network. Therefore, it is not clear which part of
     the converging networks is meant by these claims.

6. The vague and imprecise general statement in the description "the spirit of the appended claims" (page 30, line 10) implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity of the claims, Article 6 PCT, when used to interpret them.

What is claimed is:

1. A system for converging networks, comprising at least one resource manager (RM) transparently introduced in a signaling
5   path between a SS7 network node and a signaling transfer point (STP) which receives signaling messages, determines whether a bearer connection can be established over a packet network based on routing information extracted from bearer-related signaling messages, coordinates the bearer establish-
10 ment for the bearer connection over the packet network, and passes on the signaling messages.

2. The system of claim 1, further comprising a routing data-base for determining whether a bearer connection can be es-
15 tablished over a packet network, routing the connection over the packet network, and establishing the bearer path.

3. The system of claim 1, further comprising a media gateway (MG) between the packet network and the network node under
20 control of the at least one RM.

4. The system of claim 3, wherein the MG assists in estab-lishing the bearer path under control of the at least one RM.

25 5. The system of claim 3, further comprising another network node, wherein the MG provides controls to establish the bearer path between the network node and the another network node.

30 6. The system of claim 5, wherein the another network node is one of a soft switch and a time division multiplexing switch (TDM).

7. The system of claim 5, wherein the another network node is
35 a soft switch and the at least one RM converts Integrated Services Digital Network User Part (ISUP) messages to bearer

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independent call control (BICC) messages and converts BICC
messages to ISUP messages.

8. The system of claim 1, wherein the at least one RM coordi-
nates processing of time division multiplexing (TDM) connec-
tions and packet connections to establish the bearer path.

9. The system of claim 8, wherein the at least one RM estab-
lishes, monitors and releases, in any combination, the bearer
path.

10. The system of claim 1, wherein the at least one RM is at
least two RMs establishing a bearer path over the packet net-
work between the network node and another network node.

11. The system of claim 10, wherein the two RMs coordinate
processing of time division multiplexing (TDM) connections
and packet connections to establish and release the bearer
path.

12. The system of claim 10, further comprising at least two
media gateways (MGs) corresponding to the at least two RMs,
the at least two MGs interfacing with the network node and
the another network node, respectively, and the packet net-
work.

13. The system of claim 1, wherein the at least one RM deter-
mines whether the routing information corresponds to a pre-
determined packet route.

14. The system of claim 1, further comprising a database
which is dynamically created and the routing information is
reconciled to a corresponding packet route as calls are
originated and processed.

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15. The system of claim 1, wherein the routing information is one of a directory number and a carrier access code (CAC).

16. The system of claim 1, wherein the at least one RM is a
5　plurality of self learning switches (SLSs).

17. The system of claim 16, wherein a first SLS of the plurality of SLSs provides an identity (ID) Tag to an ISUP message and further propagates the ISUP message and ID Tag over
10　the network.

18. The system of claim 17, wherein the first SLS propagates the ISUP message and ID Tag to a second SLS which then provides another unique ID Tag to the ISUP message and sends a
15　tag seen message including an ID of the second SLS to the first SLS.

19. The system of claim 18, wherein the tag seen message is sent over at least any one of a packet network, a SS7 net-
20　work, and a wireless network.

20. The system of claim 18, wherein the second SLS further propagates the ISUP message with the another unique ID Tag over the network, wherein if another SLS of the plurality of
25　SLSs responds to the ISUP message then the another unique ID Tag is replaced with a new unique ID Tag of the another SLS and propagated over the network and sends another tag seen message to the one of the plurality of SLSs identifying the another SLS.

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21. The system of claim 18, wherein the first SLS builds a routing entry in a routing database to define one or more routes to at least one of the plurality of SLSs when a final tag seen message is received by the first SLS.

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22. The system of claim 21, wherein the routing entry includes at least any one of an Internet Protocol (IP) address, a directory number, a carrier access code, an SLS address, a name of the B-party, and a network node identifier.

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23. A method for converging networks, comprising the steps of:

    transparently introducing at least one resource manager (RM) in a signaling path between a SS7 network node and a

10 signaling transfer point (STP);

    receiving signaling messages at the resource manager;

    determining whether a bearer connection can be established over a packet network based on routing information extracted from bearer-related signaling messages;

15   coordinating the bearer establishment for the bearer connection over the packet network; and

    passing on the signaling messages.

24. The method of claim 23, further comprising the steps of:

20   monitoring the routing information associated with a call from the network node; and

    routing the call and establishing a bearer path over the packet network when an entry in a routing database corresponds to the routing information.

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25. The method of claim 23, further comprising establishing the bearer path between the packet network and the network node with the RM instructing at least one media gateway to assist in establishing the bearer path.

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26. The method of claim 25, further comprising establishing the bearer path between the network node and another network node.

35 27. The method of claim 26, further comprising the steps of:

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converting at least one Integrated Services Digital Network (ISDN) User Part (ISUP) message to at least one bearer independent call control (BICC) message; and
converting the at least one BICC message to the at least one
5   ISUP message.

28. The method of claim 23, wherein the establishing step includes coordinating processing of time division multiplexing (TDM) connections and packet connections to create and re-
10   lease the bearer path.

29. The method of claim 23, further comprising determining whether the routing information corresponds to a pre-determined packet route and the routing information includes
15   one of a directory number and a carrier access code.

30. The method of claim 23, further comprising the steps of:
     adding a Tag to an ISUP message which identifies a creator of the Tag;
20   propagating the ISUP message with the Tag across the network;
       sending a Tag seen message which identifies a sender of the Tag seen message over the packet network; and
       propagating the ISUP message including the identity of
25   the sender of the Tag seen message across the network.

31. The method of claim 30, further comprising creating at least one routing entry in a routing database when a last Tag seen message is received, the entry defining a route includ-
30   ing at least any one of an Internet Protocol address (IP) address, a network node identifier, a RM address, a B-party name, and a media gateway address.

32. The method of claim 30, further comprising the step of:
35   adding a counter to the ISUP message to track the sequence of the Tag seen message; and

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incrementing the counter when a Tag seen message is
sent.

33. A computer program product comprising a computer usable
5   medium having readable program code embodied in the medium
for implementing the method according to any of claims 23 to
32.

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